Name: Date:
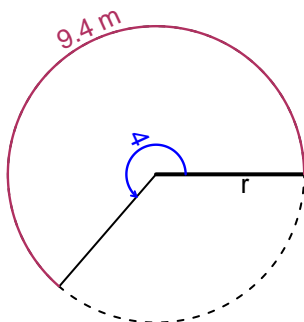
# Trig Final (TEST v677)

- You can use a calculator (like Desmos)
- You should have a unit-circle with special angles and coordinates marked.
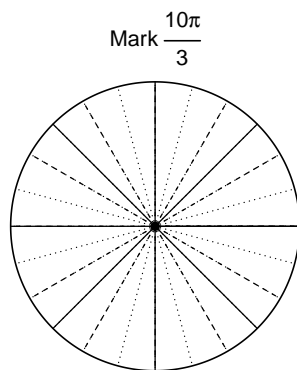
### Question 1

In the figure below, we see a circle and a central angle that subtends an arc. The arc length is 9.4 meters. The angle measure is 4 radians. How long is the radius in meters?
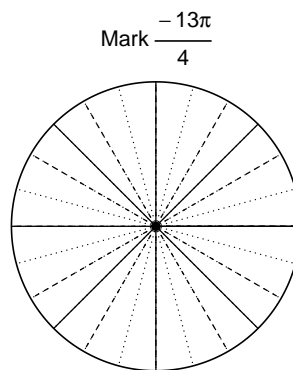


### Question 2

Consider angles $\frac{10\pi}{3}$ and $\frac{-13\pi}{4}$. For each angle, use a spiral with an arrow head to **mark** the angle on a circle below in standard position. Then, find **exact** expressions for $\sin\left(\frac{10\pi}{3}\right)$ and $\cos\left(\frac{-13\pi}{4}\right)$ by using a unit circle (provided separately).



Mark $\frac{10\pi}{3}$

Find sin(10π/3)



Mark $\frac{-13\pi}{4}$

Find cos(−13π/4)

**Question 3**

If $\tan(\theta) = \frac{-45}{28}$, and $\theta$ is in quadrant II, determine an exact value for $\sin(\theta)$.

**Question 4**

A mass-spring system oscillates vertically with a midline at $y = 5.45$ meters, an amplitude of 7.14 meters, and a frequency of 3.89 Hz. At $t = 0$, the mass is at the minimum height. Write an equation to model the height ($y$ in meters) as a function of time ($t$ in seconds).